WHAT IS CLAIMED IS:

1. An ozone generator comprising:

a pair of electrodes provided in spaced opposing relation;

electrically conductive members adapted to connect said pair of electrodes to a power source for applying a voltage between said pair of electrodes and generating an electric discharge between the electrodes;

a dielectric provided between said spaced opposing electrodes; and

a gas flow passage for effecting flow of a material gas between said spaced opposing electrodes,

wherein at least one of the electrodes has a surface including a plurality of grooves, and the material gas flows in a space defined between the plurality of grooves and the dielectric, in a direction transverse to the grooves.

2. The ozone generator according to claim 1, wherein the plurality of grooves extend substantially in parallel with each other.

3. The ozone generator according to claim 1, wherein the other of said opposing electrodes has a flat surface and the dielectric between the electrode surfaces is disposed to cover said other flat electrode surface.

4. The ozone generator according to claim 1, wherein said electrode surfaces have a circular form and the material gas flows through an outer peripheral space formed at an outer circumferential portion of the circular electrode surface, a disk-shaped space between said electrode surface and the dielectric, a central space formed at a central portion of said electrode surface, and a radial passage extending radially from said central space.

5. The ozone generator according to claim 1, wherein one of the pair of electrodes is supported by a holding plate through an insulating plate, wherein a cooling medium flow passage is formed in each of the holding plate and the other electrode, and wherein an electrically conductive cooling medium flows through either one or both of the

cooling medium flow passage of the holding plate and the cooling medium flow passage of said other electrode.

6. The ozone generator according to claim 1, comprising a plurality of pairs of electrodes arranged in a stacked configuration, each pair of electrodes being provided in opposing relation.

7. The ozone generator according to claim 1, wherein the dielectric comprises a sapphire.

8. An electric discharge cell for an ozone generator, comprising:

a pair of electrodes provided in spaced opposing relation, with each of the electrodes having surfaces which are generally circular in form;

electrically conductive members adapted to connect said pair of electrodes to a power source; and

a gas flow passage for effecting flow of a material gas defined by the surfaces of said opposing electrodes,

wherein one of said surfaces is covered by a flat dielectric plate, and the other of said surfaces includes a plurality of concentric or generally concentric circular grooves, and wherein the material gas is caused to flow in a direction transverse to said plurality of grooves.

9. The electric discharge cell according to claim 8, wherein the dielectric comprises a sapphire.

10. The electric discharge cell according to claim 8, wherein the material gas is caused to flow radially inward from an outer circumferential portion to a central portion of the electrode surfaces.

11. The electric discharge cell according to claim 8, wherein one of the pair of electrodes is supported by a holding plate through an insulating plate, wherein a cooling medium flow passage is formed in each of the holding plate and the other electrode, and wherein an electrically conductive cooling medium is caused to flow through either one or both of the cooling medium flow passage of the holding plate and the cooling medium flow passage of said other electrode.

12. An ozone generator comprising a plurality of electric

discharge cells of claim 8 arranged in a stacked configuration, wherein the cooling medium flow passage of said holding plate is communicated with a cooling medium inlet and a cooling medium outlet provided at an outer circumferential surface of the holding plate and the cooling medium flow passage of said other electrode is communicated with a cooling medium inlet and a cooling medium outlet provided at an outer circumferential surface of said other electrode, wherein said cooling medium outlet of the holding plate is communicated with said cooling medium inlet of said other electrode, and wherein the cooling medium is water.

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